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NASA CR-
144786

# A Survey of the Utility of Satellite Magnetometer Data for Application to Solid-Earth Geophysical and Geological Studies

Final Report NASA Contract No. S-500-29A

Modication No. 8




U. S. Geological Survey

September, 1975

This report has not been edited or reviewed for conformity with U. S. Geological Survey standards and nomenclature.

(NASA-CR-144786) A SURVEY OF THE UTILITY OF SATELLITE MAGNETOMETER DATA FOR APPLICATION TO SOLID-EARTH GEOPHYSICAL AND GEOLOGICAL STUDIES Final Report (Geological Survey, Reston, Va.) 30 p HC $4.00 CSCL 08G
N76-28631
Unclas
G3/43 48126



## INTRODUCTION

The U. S. Geological Survey (USGS) on behalf of Goddard Space Flight Center (National Aeronautics and Space Administration) conducted a survey of potential users of low altitude satellite magnetic measurements for solid-earth and geological studies. The principal objectives of this survey were to: a) document the utility and application of the data and resultant products obtained from such a satellite mission, and b) to establish a users committee for the proposed low altitude vector magnetometer satellite.

This report summarizes the results of the survey. In addition to this report bound copies of all survey responses, respondents names and addresses in alphabetical order, and survey responses in computer coded cards are submitted under separate cover.

## SURVEY

In May, 1975 8,900 letters and questionnaires were mailed out. This included 6000 addresses on the Society of Exploration Geophysicists domestic mailing list and 2900 mailings to the American Geophysical Union's

Geomagnetism and Paleomagnetism Section membership. A conservative estimate is that there is at least a ten percent overlap between these two mailing lists. Copies of the letters and the questionnaire are contained in Appendix I-A.

## SURVEY RESULTS

As of September 1, 1975 we had received 2,448 responses. This represents approximately 28% of the total number of questionnaires. A summary questionnaire with the tabulated responses is shown in Table 1. The total responses to all questions does not always equal 2,448 because in some instances there were no responses to several questions and in other instances there was more than one response.

In addition to replys from individual scientists there were also several corporate responses. This alone is an indication of the interest in such global magnetic measurements that exists within the industrial and scientific communities. A selection of these are presented in Appendix I-B. Furthermore, there were also repsonses from most state and national geological surveys.

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TABLE I

1. Do you use magnetic data or anomaly maps on a regional or global scale?
☐ Yes 1755 ☐ No 655

2. If satellite magnetic data at an altitude of 200-400 km were available, would you use it?
☐ Yes 787 ☐ No 451 ☐ Possibly 1158

3. If regional or global scale magnetic anomaly maps derived from such data were available, would you use them?
☐ Yes 1051 ☐ No 339 ☐ Possibly 961

1. Have you used geomagnetic field models? ☐ Yes 1153 ☐ No 1238

2. If accurate, up-to-date models were available, would you use them?
☐ Yes 1599 ☐ No 567

3. In which form would such models be most useful?
☐ Computer Program 684 ☐ Chart 719 ☐ Table 75

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1. Please indicate your field(s) of interest
☐ mineral exploration 731
☐ petroleum exploration 1366
☐ crustal studies 690
☐ secular change studies 170
☐ studies of field sources 208
☐ space science applications 303
☐ regional field removal in magnetic survey data 495
☐ other (please specify) 346

1. Please indicate the accuracy desired: ☐ at surface 972 ☐ at satellite 181

| | 1) Magnetic Data | 2) Anomaly Maps | 3) Field Models |
|---|---|---|---|
| ) not use | ☐ 197 | ☐175 | ☐ 219 |
| Y (8 arc seconds) | ☐ 647 | ☐515 | ☐ 32 |
| 0Y (80 arc seconds) | ☐ 306 | ☐471 | ☐ 271 |
| 00Y (6 arc minutes) | ☐ 53 | ☐90 | ☐ 108 |
| )ther)_____ | ☐ 27 | ☐25 | ☐ 19 |
| )t Sure | ☐ 485 | ☐486 | ☐ 555 |

) Would you be interested in participating in a users committee to define the requirements, and possibly participate in the analysis, of data from the described satellite magnetometer experiment? This does not represent a formal commitment.
☐ Yes 381 ☐ No 1400 ☐ Undecided 591

) Would you like to remain on our mailing list to receive information, reports, etc., on the satellite magnetometer experiment, geomagnetic field models, and global magnetic data?
☐ Yes 2070 ☐ No 346

filiation
) Research Lab 122 ☐ Government 328 ☐ University 625 ☐ Industry 1330

A) Utility of Satellite Data

The first three questions address the utility of satellite magnetometer data and resultant maps in geophysical studies. It should be noted that this is an application area that has only recently been developed (Regan et al, 1975). However, the results of these questions clearly indicate that there is substantial interest in this area. The high number of responses of "Possibly" to the second and third questions are undoubtedly indicative of the contemporary nature of such studies.

B) Geomagnetic Field Models

The results of the next three questions indicate that about one half of the respondents have used field models. Yet the response to question B-2 indicates there is apparently some reluctance to use present field models, undoubtedly because of their inaccuracies. Clearly there is a need for more accurate, up to date field models. A prerequisite for such models is the accurate global, vector measurements that could be provided by the proposed satellite magnetometer.

Of particular interest is the form in which users would like to see field models presented. Although most people would prefer to have field models in chart form, there are, at present, no models presented in such a manner.

c) Field of Interest

Question C in the tabulated form summarizes the fields of interest. The practical applicability of the satellite derived data to geophysical exploration is indicated by the high number of responses from people involved in mineral and petroleum exploration. This is also reflected in the corporate responses contained in Appendix I-B and in the large number of responses from industry. The last line of the questionnaire summarizes the affiliations and Table 2 presents a cross reference between affiliation and field of interest.

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TABLE 2

A Listing of Responses Categorized by Affiliation and Area of Interest

| Affiliation | Area of Interest | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Mineral Exploration | Crustal Studies | Studies of Field Sources | Regional Field Removal | Other | Petroleum Exploration | Secular Change Studies | Space Science Application |
| Research Lab | 21 | 23 | 10 | 19 | 22 | 36 | 13 | 45 |
| Government | 86 | 132 | 49 | 96 | 89 | 64 | 52 | 81 |
| University | 167 | 330 | 101 | 172 | 125 | 138 | 88 | 132 |
| Industry | 443 | 193 | 46 | 198 | 102 | 1108 | 16 | 40 |
| No Affiliation Noted | 14 | 12 | 2 | 10 | 8 | 20 | 1 | 5 |

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D) Accuracy and Altitude of Data

The response to this question indicate that people are not certain about the accuracies involved with such data (particularly at satellite altitude). This is no surprise and is again reflective of the contemporary nature of such studies.

Basically there seems to be two groups of respondents; those that are not sure of accuracy required and those who would request that measurements be obtained as accurately as possible. A detailed analysis of the responses' indicate that more precise answers were presented for measurements at the surface while the "Not Sure" category was checked by many for satellite data. However approximately half of the respondents did not reply to this question. This is indicated in Table 3 that categorizes the responses by affiliation and desired altitude of data.

E) Users Group and Mailing List

Names and addresses of those people willing to participate in a users committee, undecided about such participation, and those wishing to remain on a mailing list are contained in Appendix II - A, B, and C respectively. Because of the volume of such a listing this appendix is published as a separate report for distribution only to the contract monitor at Goddard Space Flight Center.

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TABLE 3

Responses Categorized by Affiliation and Altitude

| Affiliation | Altitude | | | |
|---|---|---|---|---|
| | Satellite | Surface | Both | No Response |
| Research Lab | 24 | 28 | 3 | 64 |
| Government | 47 | 119 | 10 | 138 |
| University | 75 | 288 | 11 | 241 |
| Industry | 34 | 528 | 16 | 746 |
| No Affiliation Noted | 1 | 9 | 0 | 37 |

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## CONCLUSIONS

The main conclusion to be drawn from the overwhelming response to this survey is that there is considerable interest, in both the scientific and industrial communities, in the utility of satellite magnetometer data.

There is also broad support for the proposed vector magnetometer satellite in near earth orbit. This is evident by the almost 400 responses from people interested in serving on a users committee. The proposed satellite data will have direct application to both regional and global magnetic anomaly maps and in the production of more accurate geomagnetic field models. These are timely concerns of both communities as indicated by this survey.

It should also be mentioned that because one of the objectives of this survey was to form a users committee, the majority of questionnaires were sent to domestic addresses. The results of the survey only weakly reflect the substantial international interest in the application of satellite magnetometer data to geological studies.

## REFERENCES

Regan, R. D., Cain, J. C., and W. M. Davis, 1975, A Global Magnetic Anomaly Map, Journal of Geophysical Research, v. 80, n. 5, p. 794.

Appendix I-A

Letters and Questionnaire

a) Letter to Society of Exploration Geophysicists membership

b) Letter to American Geophysical Union membership

c) Questionnaire

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United States Department of the Interior
GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

Dear Colleague:

We have been asked by NASA/Goddard Space Flight Center to survey the potential users of satellite magnetometer data, anomaly maps, and resultant geomagnetic field models in solid-earth geophysical and geological studies. This is an appropriate time for such an undertaking because a low altitude, three axis vector magnetometer satellite is one of several missions now under serious consideration by NASA.

The data derived from such a satellite should be of considerable interest to the geophysical exploration community. The global magnetic anomaly map produced as a result of our analysis of the POGO satellite magnetometer data represents an anomalous field that is most likely related to crustal structure. Perhaps of more immediate interest is the fact that satellite measurements represent the only viable method for obtaining up to date global data necessary for input to global and national magnetic charts and for the development of improved geomagnetic field models suitable for use in the reduction of magnetic surveys.

Available satellite magnetometer data were derived from missions primarily designed for magnetospheric studies. Consequently, the measurements were made at predominantly high altitudes. Also, because of technical limitations, only total field measurements were obtained. Thus, the resolution of resultant anomaly maps and the angular accuracy of derived field models are limited. Also, the most recent satellite measurements were made in 1971 and there are not at present any alternative plans for obtaining new global measurements.

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Let's Clean Up America For Our 200th Birthday

The vector satellite mission under consideration by NASA is designed to overcome these limitations. The low altitude (200-400 km; very low for a satellite) will provide a several fold increase in spatial resolution and sensitivity over previous satellite data, and the vector measurements, now technically feasible, would make possible more accurate global field models from the satellite data. The measurements would also provide a measure of recent secular change.

The main reason for our survey is to insure that the data derived from such a mission will have maximum utility to as many applications as possible. Accordingly, we would like to solicit your views on the potential utility of such data to your studies, your particular application of the data, and your interest in participating in a data users group. As an aid in formating your reply, we have prepared the enclosed questionnaire. However, the most important aspect of our inquiry is to obtain your views; so please do not be constrained by the questionnaire, but feel free to respond in any manner.

Thank you for considering our questionnaire. Your response is considered essential in designing and providing optimal satellite magnetometer data.

Very truly yours,

Robert D. Regan
Geophysicist
Office of Geochemistry
and Geophysics

Enclosure

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United States Department of the Interior
GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

Dear Colleague:

We have been asked by NASA/Goddard Space Flight Center to survey the potential users of satellite magnetometer data, anomaly maps, and resultant geomagnetic field models in solid-earth geophysical and geological studies. This is an appropriate time for such an undertaking because a low altitude, three axis vector magnetometer satellite is one of several missions now under serious consideration by NASA.

The data derived from such a satellite should have wide application in many areas of geophysical studies. For example, the global magnetic anomaly map (JGR, 1975, v. 80, no. 5, p. 794) produced as a result of our analysis of the POGO satellite magnetometer data represents an anomalous field that is most likely related to crustal structure. Also, satellite measurements represent the only viable method for obtaining up to date global data necessary for the development of improved geomagnetic field models and are valuable to studies of the origin and physics of the main geomagnetic field.

Available satellite magnetometer data were derived from missions primarily designed for magnetospheric studies. Consequently, the measurements were made at predominantly high altitudes. Also, because of technical limitations, only total field measurements were obtained. Thus, the resolution of resultant anomaly maps and the angular accuracy of derived field models are limited. Also, the most recent satellite measurements were made in 1971 and there are not at present any alternative plans for obtaining new global measurements.

The vector satellite mission under consideration by NASA is designed to overcome these limitations. The low altitude (200-400 km; very low for a satellite) will provide a several fold increase in spatial resolution and sensitivity over previous

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Let's Clean Up America For Our 200th Birthday

satellite data, and the vector measurements, now technically feasible, would make possible more accurate global field models from the satellite data. The measurements would also provide a measure of recent secular change.

The main reason for our survey is to insure that the data derived from such a satellite magnetometer mission will have maximum utility to as many applications as possible. Accordingly, we would like to solicit your views on the potential utility of such data to your studies, your particular application of the data, and your interest in participating in a data users group. As an aid in formating your reply, we have prepared the enclosed questionnaire. However, the most important aspect of our inquiry is to obtain your views; so please do not be constrained by the questionnaire, but feel free to respond in any manner.

Thank you for considering our questionnaire. Your response is considered essential in designing and providing optimal satellite magnetometer data.

Very truly yours,

Robert D. Regan
Geophysicist
Office of Geochemistry
and Geophysics

Enclosure

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QUESTIONNAIRE

Approval Expires July, 1975

A)

1. Do you use magnetic data or anomaly maps on a regional or global scale?
   ☐ Yes ☐ No

2. If satellite magnetic data at an altitude of 200-400 km were available, would you use it? ☐ Yes ☐ No ☐ Possibly

3. If regional or global scale magnetic anomaly maps derived from such data were available, would you use them? ☐ Yes ☐ No ☐ Possibly

B)

1. Have you used geomagnetic field models? ☐ Yes ☐ No

2. If accurate, up-to-date models were available, would you use them?
   ☐ Yes ☐ No

3. In which form would such models be most useful?
   ☐ Computer Program ☐ Chart ☐ Table

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C)

1. Please indicate your field(s) of interest
   - ☐ mineral exploration
   - ☐ petroleum exploration
   - ☐ crustal studies
   - ☐ secular change studies
   - ☐ studies of field sources
   - ☐ space science applications
   - ☐ regional field removal in magnetic survey data
   - ☐ other (please specify)_____

D)

1. Please indicate the accuracy desired:

| | 1) Magnetic Data ☐ at surface | 2) Anomaly Maps ☐ at surface | 3) Field Models ☐ at satellite |
|---|---|---|---|
| Do not use | ☐ | ☐ | ☐ |
| ±2γ (8 arc seconds) | ☐ | ☐ | ☐ |
| ±20γ (80 arc seconds) | ☐ | ☐ | ☐ |
| ±100γ (6 arc minutes) | ☐ | ☐ | ☐ |
| (other)_____ | ☐ | ☐ | ☐ |
| Not Sure | ☐ | ☐ | ☐ |

E) Would you be interested in participating in a users committee to define the requirements, and possibly participate in the analysis, of data from the described satellite magnetometer experiment? This does not represent a formal commitment.
   ☐ Yes ☐ No ☐ Undecided

G) Would you like to remain on our mailing list to receive information, reports, etc., on the satellite magnetometer experiment, geomagnetic field models, and global magnetic data?
   ☐ Yes ☐ No

H) Name_____
   Address_____
   _____
   _____

Affiliation
☐ Research Lab ☐ Government ☐ University ☐ Industry

PLEASE FOLD SO THAT RETURN ADDRESS IS VISIBLE, STAPLE, AND MAIL. NO POSTAGE REQUIRED IF MAILED WITHIN THE UNITED STATES.

Appendix I-B

Corporate Responses

C. E. EDWARDS
P. O. BOX 36487
HOUSTON, TEXAS 77036

May 20, 1975

Mr. Robert D. Regan, Geophysicist
Office of Geochemistry & Geophysics
U. S. Department of The Interior
Reston, Virginia 22092

Dear Mr. Regan:

As you know, the Interior Department's questionnaire regarding satellite magnetometer data was sent to a large number of industry geophysicists. To assist you in an assessment of Company interest, we have compiled the attached, which is a consensus of thinking by geophysicists occupying responsible technical positions of research and operations in Standard Oil Company of California.

We trust you will be able to properly weight this "Company" response in relationship to other replies by individual professionals.

Very truly yours,

C. E. Edwards

C. E. Edwards
Chief Geophysicist

Attachment

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Ressources Canada
Science and Technology

Ressources Canada
Science et Technologie

May 14, 1975

Your file / Votre référence

Our file / Notre référence
4215

Dr. Robert D. Regan
U.S. Geological Survey
National Center (906)
Reston, Virginia 22092
U.S.A.

Dear Bob:

Although your questionnaire on the potential uses of satellite magnetometer data is intended for individual scientists rather than for institutions, I have been asked by the Director-General of the Earth Physics Branch to submit a written reply to the points raised in your covering letter expressing the official reaction of this organization.

I imagine that most of your respondents will be interested in the application of data from low-level magnetic survey satellites to the study of large-scale anomalies as they relate to crustal structure. This is a subject of great interest to our Department, but Canada is already covered systematically by airborne magnetic surveys, and it is most unlikely that satellite surveys will reveal any anomalies of crustal origin which are not already known. Phase I (1953-63) of the three-component airborne magnetic survey program of the Earth Physics Branch covered Canada and adjacent ocean areas with a reasonably uniform distribution of magnetic observations on flight lines spaced 100 to 200 km apart. Phase II (1965-76) will cover the same area with flight lines spaced 35 to 75 km apart. In addition, more than 60 percent of Canada has been covered since 1947 by detailed low-level aeromagnetic surveys of total intensity, with a flight-line spacing of less than 1 km, under the Federal-Provincial program organized by the Geological Survey of Canada. While there are real difficulties in compiling a coherent picture of magnetic anomalies with dimensions of 100 to 1000 km from observations made over periods of many years and by different methods, the necessary data are there, and the problems are basically more tractable than the identification and extrapolation of the small signals available at satellite altitude.

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Earth Physics Branch
1 Observatory Crescent
Ottawa Canada
K1A 0E4

Direction de la Physique du Globe
1 Place de l'Observatoire
Ottawa Canada
K1A 0E4

For the study of anomalies with wavelengths greater than 1000 km, the global coverage of a satellite survey of course gives an advantage over the most detailed regional surveys, which tend to leave unanswered many questions near their boundaries.

The main interest of the Earth Physics Branch in satellite magnetic surveys is for the determination of secular change. This is because three-component airborne magnetic surveys over Canada will cease, for ten years at least, following completion of Phase II in 1976. We wish to preserve as long as possible the usefulness of the excellent data base for magnetic charts and models which will exist in 1976. Although we are planning an intensified program of re-occupation of secular change stations, and increased effort to find a reliable method of correcting for disturbance observations taken at repeat stations in high latitudes, we will need all the help we can get from component observations by satellite, especially over adjacent ocean areas. For this purpose, it is important that satellite data become available soon; ideally, we should have an overlap of airborne and satellite data.

To prepare ourselves for the utilization of satellite data for the above purpose, we intend to (a) pursue studies of upward continuation of airborne survey results to satellite altitude for comparison with existing satellite data, and (b) make an effort to find a solution to the serious problem of the correction for magnetic disturbance of satellite observations from the auroral zone and polar cap regions. We hope to work in cooperation with NASA and your own organization on both these problems. As you know, Dr. R.L. Coles will be visiting you and Dr. Langel in July to discuss possible approaches to these problems.

Yours sincerely,

M.S Bradfield

for Paul H. Serson
Director
Division of Geomagnetism

PHS/mb

cc Dr. K. Whitham

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A.C. BECHTOLD
PT. WALTER M. SCHIRRA, JR.

Bechtold Satellite Technology Corp.
12137 EAST GALE AVENUE • CITY OF INDUSTRY, CA. 91745
(213) 965-7353

BESTEC

May 15, 1975

Dr. Robert D. Regan
U.S. Geological Survey
National Center (906)
Reston, Virginia 22092

Dear Dr. Regan:

Your undated letter concerning potential uses of satellite magnetometer data, received here May 5 has been studied with great interest.

We heartily endorse the idea of establishing such a project. Data from it would be extremely useful to us and others in our fields of interest (geology, geophysics, mineral, petroleum, geothermal exploration) and would add a new dimension to magnetometry.

We are specializing in ground based magnetometry confirmation of faults already identified in space imagery.

The little bit of Russian data from satellites which we have received has been extremely useful.

We would welcome an opportunity to serve on your committees or otherwise be of assistance to you and NASA.

With best wishes for the success of your program, I am,

Sincerely,

Ira C. Bechtold Jr.

Ira C. Bechtold
President

enc: table

cc: file

ICB:mg

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22

Dictated by ICB and signed in his absence.

EXXON PRODUCTION RESEARCH COMPANY
POST OFFICE BOX 2189 • HOUSTON, TEXAS 77001

May 14, 1975

Mr. Robert D. Regan
Geophysicist
Office of Geochemistry and Geophysics
United States Department of the Interior
Geological Survey
Reston, Virginia 22092

Dear Mr. Regan:

We endorse the concept of a low level magnetometer-bearing satellite. The integrated magnetic and magnetic anomaly data resulting from such a survey would provide valuable information to groups interested in both academic and economic aspects of global geophysical data.

Attached is our answer to your questionnaire. We look forward to hearing more from you on this matter.

Very truly yours,

J. B. Blizzard

JBC:ck
enclosure

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TransOcean Oil, Inc.
1700 FIRST CITY EAST BUILDING
1111 FANNIN • HOUSTON, TEXAS 77002
713 • 225-0281

May 12, 1975

Mr. Robert D. Regan
Office of Geochemistry & Geophysics
Geological Survey
Department of the Interior
Reston, Va., 22092

Dear Mr. Regan,

We would be very interested in the results of regional magnetic observations from a low level satellite. There are many parts of the world where this could be of value in hydrocarbon exploration.

Please keep us informed of the programs progress and contact us if there is any way we can be of assistance.

Sincerely,

William A. Lamont

W.L./tr
CC: F.F. Foster

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515 South Flower Street
Mailing Address: Box 2679 - T.A.
Los Angeles, California 90051
Telephone 213 486 3618

J. S. Pluta
Chief Geophysicist
International Exploration and Production Dept.

May 7, 1975

Mr. Robert D. Regan
Geophysicist
Office of Geochemistry and Geophysics
United States Department of the Interior
Geological Survey
Reston, Virginia 22092

Dear Mr. Regan:

In regards to potential user of Satellite Magnetometer data please be advised we feel at this time we are not able to evaluate the significance of such data; however, we would like very much to remain on your mailing list in order to receive information on the satellite magnetometer experiments, geometric field models, and global magnetic data.

Yours very truly,

J. S. Pluta

JSP/ac

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Rockville, Md. 20852

EM4

MAY 16 1975

Mr. Robert D. Regan
Geophysicist
Office of Geochemistry and
Geophysics
U.S. Department of the Interior
Geological Survey
Reston, Virginia 22092

Dear Mr. Regan:

We had intended to provide a composite NOAA reply to the subject questionnaire. However, almost all in NOAA who have an interest in Satellite Magnetometer Data have received personal questionnaires and have completed them on their own.

There is one questionnaire which represents our data service input which we are forwarding.

Sincerely,

John W. Townsend, Jr.
Associate Administrator

Enclosure

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May 6, 1975

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Robert D Regan
Office of Geodesy & Geophysics

Dear Bob:

Thanks again for thinking of me in connection with plans for the NASA mission to acquire vector magnetometer data.

I have discussed your notice and the questionaire with several Survey people here as well as with a couple of geophysicists with the University of W. The responses given on the questionaire over my signature really represent a composite of the reactions of several interested individuals. A few words of clarification therefore may be in order.

It strikes me that the highly filtered nature of high-quality satellite magnetic data may make them peculiarly well suited for studies of intermediate to gross tectonic elements as is hinted by some of the POGO data. There is no question therefore that should such data become generally available, I would directly or indirectly investigate their utility.

or applicability, to research on sedimentary basins (locations, size, fill thickness, shape, etc) of interest in petroleum exploration. The initial investigations would necessarily be experimental or tentatively exploratory in nature. Should promising leads develop, extensive applications are easy to imagine, especially in such poorly explored frontiers as much of the U.S. Continental margin, big parts of Alaska, and selected foreign areas of current interest to the U.S. When or how extensive (or limited) each use might be is impossible to define in the absence of the data.

Thanks again.

Yours truly,

Marc Ewbank

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DEFENSE MAPPING AGENCY

INTER AMERICAN GEODETIC SURVEY

FORT CLAYTON, CANAL ZONE

IAGS-TD-S

13 May 1975

Dr. Robert D. Regan
U.S. Geological Survey
National Center (906)
Reston, Virginia 22092

Dear Dr. Regan:

Your recent undated flyer describing the vector satellite mission under consideration by NASA is of great interest to us.

The Defense Mapping Agency Inter American Geodetic Survey (IAGS), although primarily engaged in the geodesy and cartography of Latin America, has for over 25 years maintained a responsibility for the collection of geomagnetic data. The small percentage of our total resources expended for surface vector surveys and observatory maintenance has been a major influence.

The IAGS geomagnetic program is justified by cartographic and navigational requirements for compass deviation, but is in fact, a continuation of the work initiated at the turn of the century by the Carnegie Institution and extended during the 40's by the U.S. Coast and Geodetic Survey.

IAGS functions as a collection source but we are also concerned with the return to participating agencies of useful data products, and the validity of technical guidance we furnish to Latin America. If the low altitude vector satellite is eventually deployed, we would try to reorient the Latin American ground program to complement rather than duplicate the expected results.

We will be very interested in information concerning details and progress of the NASA Satellite Project.

Yours very sincerely,

Roman F. Geller Jr

ROMAN F. GELLER, JR.
DMA IAGS Staff Geophysicist

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